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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Pulimi et al. )  
 For: Antenna Apparatus with Inner )  
       Antenna and Grounded Outer )  
       Helix Antenna )  
 Serial No.: 09/606,445 )  
 Filed: June 29, 2000 )  
 Examiner: Gelin, J. )  
 Art Unit: 2681 )

**OFFICIAL**

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 Commissioner for Patents  
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 Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

**APPELLANTS' BRIEF**

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This brief is in furtherance of the Notice of Appeal, filed via facsimile transmission on September 8, 2003.

The fees required under § 1.17, and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is being transmitted by facsimile, and therefore the requirement that it be transmitted in triplicate is believed to be waived.

This brief contains these items under the following headings, and in the order set forth below (37 C.F.R. § 1.192(c)):

- I      REAL PARTY IN INTEREST
- II     RELATED APPEALS AND INTERFERENCES

- III STATUS OF CLAIMS
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### I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Motorola, Inc., a Delaware corporation.

### II. RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences.

### III. STATUS OF CLAIMS

#### A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 15

#### B. STATUS OF ALL THE CLAIMS

- 1. Claims canceled: 9
- 2. Claims withdrawn from consideration but not canceled: none
- 3. Claims pending: 1-8 and 10-16
- 4. Claims allowed: 12-16
- 5. Claims objected to: 5, 7, 10 and 11

6.      Claims rejected:      1-4, 6 and 8

### C. CLAIMS ON APPEAL

The claims on appeal are:      1-8, 10 and 11

### IV. STATUS OF AMENDMENTS AFTER FINAL

RESPONSE After Final, dated August 6, 2003, entered

### V. SUMMARY OF INVENTION

The invention pertains to a multi-band antenna apparatus including a multi-band antenna (60, FIG. 3, page 4, lines 8-19) and a grounded helical antenna (24; FIG. 2; page 2, line 30 to page 3, line 8), which surrounds the multi-band antenna (60). The multi-band antenna (60) includes a first element (62) and a second element (16) having different resonant frequencies, which both extend along a linear axis (11), the second element being beside the first element (FIG. 3).

In at least one embodiment, the multi-band antenna includes a monopole antenna (62) and a helical antenna (16).

In at least a further embodiment, the distance between adjacent turns of the grounded helical antenna (40) along the linear axis (11) varies (FIG. 2; page 3, lines 15-24), while in yet at least a still further embodiment, the distance between adjacent turns of the grounded helical antenna near the top section (52) is narrower than the distance between adjacent turns of the grounded helical antenna near the lower section (50).

### VI. ISSUES

1.      Whether claims 1, 3, 4 and 6 have been improperly rejected under 35 U.S.C. 102(b) as being anticipated by Tay et al. (US Patent No. 5,563,615).

2. Whether claims 2 and 8 have been improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Tay et al. (US Patent No. 5,563,615), in view of Applicants' detailed description (page 4, lines 20-27).

3. Whether claims 5, 7, 10 and 11 have been improperly objected to as being dependent upon a rejected base claim.

## VII. GROUPING OF CLAIMS

Group 1: Claims 1-3

Group 2: Claim 4-8, 10 and 11

## VIII. ARGUMENTS -- REJECTIONS UNDER 35 U.S.C. § 102

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the ... claim.

Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The Examiner has rejected claims 1, 3, 4 and 6 under 35 U.S.C. 102(b) as being anticipated by Tay et al. (US Patent No. 5,563,615). However contrary to the Examiner's assertions, Tay et al., '615, fails to make known each and every element in a manner which is consistent with the claims. In attempting to equate the teaching of Tay et al., '615, with the elements included in the claim, the Examiner has equated the same element with two elements that are necessarily distinct given the relationship of the two elements, relative to one another, as provided in the claims.

Relative to the reference cited by the Examiner, Tay et al., '615, the Examiner continues to attempt to define aspects of helical structure 12 as satisfying aspects associated with both the multi-band antenna and the grounded helical antenna provided in claim 1. However, physical aspects associated with the interaction of the different claimed elements preclude the same element from the cited reference from being equated to both of the claimed elements. More

specifically, in the claims the grounded helical antenna is described in the claim as surrounding the multi-band antenna. The same element namely helical structure 12 can not surround itself. In the Examiner's most recent response, the Examiner attempts to explain away this paradox, citing several passages from the cited reference, Tay et al., '615, which refer to various aspects of helical coils 11 and 12. However, a review of the specific passages cited by the Examiner does not avoid the inconsistency.

The Examiner initially identifies an inner element and an outer element, illustrated in FIG. 1 and described at col. 2, lines 51-55, as being equivalent to the first element and the second element of the claimed multi-band antenna. A review of the specific passage identifies the two conductive elements as being preferably cylindrically configured, such as sleeves and helical coils 11 and 12.

Claim 1 of the present application further provides that the first and second elements have different resonant frequencies. In attempting to show that the cited reference similarly provides the equivalence of this feature, the Examiner cites col. 4, lines 12-23, where helical coil 11 is described as having a resonant frequency  $f_1$  that is less than the resonant frequency  $f_2$  of helical coil 12. In each instance, helical coils 11 and 12 are equated to the first and second elements of the claimed multi-band antenna.

However, when the examiner attempts to find the equivalent structure for the grounded helical antenna, which is described in claim 1 of the present application as surrounding the multi-band antenna, the Examiner fails to identify any other element than element 12, which in the earlier Examiner's Action was equated to element 12 (described as being shorted to ground portion 44 of FIG. 1 (Page 3 of Paper 9)). Specifically, the Examiner cites col. 2, lines 51-55 (which is silent as to an alternative element that is equated to the claimed grounded helical element) and col. 3, lines 39-52 (which is similarly silent as to an alternative element that is equivalent to the claimed grounded helical element).

Consequently, the Examiner has failed to answer the inconsistency associated with the present objection, where the Examiner uses element 12 as being equivalent to at least one aspect of the claimed multi-band antenna, as well as being equivalent to the claimed grounded helical element. Because the grounded helical antenna can not be said to surround the multi-band

antenna, if the grounded helical antenna is also part of the multi-band antenna as suggested by the Examiner, the Examiner has failed to articulate a rejection supporting a showing that each and every feature of the claims is known or obvious in view of the cited references, which includes the claimed relationship of the elements relative to one another. As a result, the Examiner has failed to meet the burden of a proper rejection. The same is true relative to independent claim 6, which includes a radio frequency (RF) grounded helical antenna surrounding an inner antenna having both a first element and a second element.

Claims 4 and 6 additionally similarly include the further feature of a grounded helical antenna, which includes turns around a linear axis, where at least some of the adjacent turns of the same grounded helical antenna have a distance between them, which varies in a direction along the linear axis (note the differences between sections 50 and 52 illustrated in FIG. 2 of the present application). No such corresponding features or elements have been described in any of the cited references. Correspondingly, the additional features of claims 4 and 6 form a separate independent basis for a finding of novelty for claims 4 and 6 and all of the claims, which depend therefrom.

#### VIIIB. ARGUMENTS -- REJECTIONS UNDER 35 U.S.C. § 103

Regarding the Examiner's rejection of claims 2 and 8 under 35 U.S.C. §103(a) as being unpatentable over Tay et al., '615, in view of statements made in the detailed description of the present application. The same is largely moot in view of their dependence upon base claims (claims 1 and 6, respectively), which are both novel and nonobvious in view of the comments noted above. The same generally holds true for the other dependent claims, which depend from claims 1 and 6, including claims 5, 7, 10 and 11, which have been objected to only to the extent that they were alleged to be dependent upon a rejected basic claim. To the extent that the dependent claims incorporate further claim details, above and beyond the features articulated in the independent claims, which are not made known or obvious, the additional details would only serve to further distinguish the claims of the present application from the references cited by the Examiner. Consequently, the dependent claims are similarly not made known or obvious, by the references cited by the Examiner.

In view of the above analysis, the applicants would assert, that the Examiner has failed to establish that any of the cited references either separately or in combination make known or obvious any of the presently pending claims. The applicants would respectfully request that the claims be reconsidered in view of the above noted reasons, that the Examiner's decision to finally reject the presently pending claims be overturned, and that the claims be permitted to proceed to allowance.

Respectfully submitted,

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**IX. APPENDIX OF CLAIMS**

The following is the text of all of the pending claims including the claims specifically involved in this appeal:

**1. A multi-band antenna apparatus comprising:**

a multi-band antenna including a first element, which extends along a linear axis, and a second element, which extends along the linear axis, beside the first element, the first and second elements having different resonant frequencies; and

a grounded helical antenna surrounding the multi-band antenna.

**2. The multi-band antenna apparatus as in claim 1 further comprising:**

a cellular telephone housing formed of a conductive material; and  
a printed circuit board (PCB) carried by the cellular telephone housing, the PCB having a metalized ground plane, the metalized ground plane and the grounded helical antenna coupled to the cellular telephone housing.

**3. A multi-band antenna apparatus comprising:**

a multi-band antenna including a helical antenna and a monopole antenna, the helical antenna and the monopole antenna having different resonant frequencies; and  
a grounded helical antenna surrounding the multi-band antenna.

4. The multi-band antenna apparatus as in claim 3 wherein the grounded helical antenna includes turns around a linear axis, a distance between at least some adjacent turns of the grounded helical antenna varying along the linear axis.

5. The multi-band antenna apparatus as in claim 4 wherein the grounded helical antenna comprises a top section and a lower section along the linear axis, the lower section coupled to the metalized ground plane and the top section located at an end opposite the lower section along the linear axis, a distance between adjacent turns of the top section narrower than a distance between adjacent turns of the lower section.

6. A cellular telephone antenna comprising:

- an inner antenna including a first element and a second element, the first and second elements having different resonant frequencies; and
- a radio frequency (RF) grounded helical antenna surrounding the inner antenna, the RF grounded helical antenna including,
  - a first section having a distance between adjacent turns of a first predetermined amount, and
  - a second section having a distance between adjacent turns of a second predetermined amount, the second predetermined amount less than the first predetermined amount.

7. The cellular telephone antenna as in claim 6 wherein a resonant frequency of the RF grounded helical antenna is substantially equal to a resonant frequency of one of the first and second elements of the inner antenna.

8. The cellular telephone antenna as in claim 6 further comprising:  
a cellular telephone housing formed of a conductive material; and  
a printed circuit board (PCB) carried by the cellular telephone housing, the PCB having a metalized ground plane, the metalized ground plane and the RF grounded helical antenna coupled to the cellular telephone housing.

9. (canceled)

10. The cellular telephone antenna as in claim 6 wherein the first antenna element comprises an inner helical element, and wherein the resonant frequency of the RF grounded helical antenna is substantially equal to a resonant frequency of the inner antenna.

11. The cellular telephone antenna as in claim 10 further comprising:  
a cellular telephone housing formed of a conductive material; and  
a printed circuit board (PCB) carried by the cellular telephone housing, the PCB having a metalized ground plane, the metalized ground plane and the RF grounded helical antenna electrically coupled to the cellular telephone housing.

12. A cellular telephone antenna comprising:

a monopole antenna tuned to a first resonant frequency of operation;

a first helical antenna coupled to the monopole antenna and having turns surrounding the monopole antenna, the first helical antenna tuned to a second resonant frequency of operation;

and

an electronically grounded second helical antenna surrounding the first helical antenna, the electronically grounded second helical antenna formed to have an upper capacitive loading segment to tune the electronically grounded second helical antenna at substantially the second resonant frequency of operation.

13. The cellular telephone antenna as in claim 12 further comprising:

a cellular telephone housing formed of a conductive material; and

a printed circuit board (PCB) carried by the cellular telephone housing, the PCB having a metalized ground plane, the metalized ground plane and the electronically grounded second helical antenna coupled to the cellular telephone housing.

14. A cellular telephone comprising:

transmitter for transmitting signals;

a receiver for receiving signals;

a synthesizer coupled to the transmitter and receiver for generating carrier frequency signals;

a controller for controlling operation of the cellular telephone;

a first helical antenna coupled to the transmitter and the receiver, the first helical antenna tuned to a resonant frequency of operation; and

a grounded helical antenna surrounding the first helical antenna, the grounded helical antenna formed to have a first section of adjacent helical turns that are spaced farther apart than adjacent helical turns of the first helical antenna, the grounded helical antenna formed to have an upper capacitive loading segment to tune the grounded helical antenna to substantially the resonant frequency of operation.

15. The cellular telephone as in claim 14 further comprising:

a cellular telephone housing formed of a conductive material; and  
a printed circuit board (PCB) having a metalized ground plane, the metalized ground plane and the grounded second helical antenna coupled to the cellular telephone housing.

16. The cellular telephone as in claim 15 further comprising a monopole antenna coupled to the first helical antenna and tuned to a second resonant frequency of operation.